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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/581,701

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EXAMINER

JACOBS, TODD D

ART UNIT

PAPER NUMBER

3746

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/581,701	Applicant(s) SATO ET AL.	
	Examiner TODD D. JACOBS	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/6/2006</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1, 3-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1, line 13 states "wherein two magnetic levitation motors", however line 8 claims the limitation "two magnetic levitation motors". It is not clear if the motors of line 13 are in addition to the previous motors, or are just referencing the previous motors. Since in the specification there are just two motors, the above quote of line 13 will be interpreted as "wherein the two magnetic levitation motors".

4. Claim 6, line 1 states "said magnetic levitation motor includes...a stator...a rotor", however it is unclear whether *each* motor includes a stator and a rotor or there is one stator and rotor between the two motors. For the purposes of this examination it will be interpreted that the above quote be "**each** said magnetic levitation motor includes...a stator...a rotor".

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sabini (5,915,921) in view of Vogel et al (6,043,580) in further view of Stepanoff (2,358,744).

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7. In re claim 1, Sabini discloses (see Fig 2 for reference) a fluid conveying machine comprising:

- a rotational shaft (14);
- a double suction type centrifugal pump (16, along with other surrounding pump equipment), said double suction type centrifugal pump having a double suction type impeller (16) attached to said rotational shaft for pressurizing a fluid in a centrifugal direction, a pump casing (12) disposed so as to surround said impeller, and;
- wherein said pump is disposed substantially at a center of said rotational shaft in the axial direction.

8. However, Sabini fails to disclose magnetic levitation motors, each of said magnetic levitation motors having a function as a radial magnetic bearing for supporting said rotational shaft in a non-contact manner and a function as a motor for rotating said rotational shaft, wherein the two magnetic levitation motors are disposed on both sides of said pump.

9. Nevertheless, Vogel discloses a pump that, as shown in Fig. 1 has magnetic levitation motors on each side of the pump. Since they hold the shaft in a non-contact manner, functioning as a bearing as well as a power source there is a significantly low amount of friction, resulting in a pump with higher efficiency.

10. Therefore, it would have been obvious to modify Sabini in view of Vogel by adding the motors of Vogel (to each side of the pump, the motors consisting of journalled rotor (4a of Vogel), stator/bearing (1 of Vogel), and other necessary equipment), while removing previous rotating equipment of Sabini in order to increase the rotating efficiency of the pump of Sabini.

11. However, Sabini also fails to disclose a pressure balance mechanism for positioning said rotational shaft in an axial direction.

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12. Nevertheless, Stepanoff discloses a pressure balance mechanism (46, 47) in the system for positioning the rotational shaft (41) in an axial direction. This system allows one to vary the output of the system so that the output pressure is balanced with the desired pressure; also this system's spring applies a balance pressure (against the incoming fluid pressure) to each side of the impeller hub so that it rests against the rotational shaft as shown in Fig 1.

13. Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the pressure balance mechanism described above by Stepanoff in the pump of Sabini/Vogel as described above in order to have a system that allows one to vary pressure outputs.

14. In re claim 3, Sabini discloses the fluid conveying machine as recited in claim 1, wherein said pump casing having a double volute (see col 2, line 7, "FIG. 5 is a cross-section of a standard double volute pump...the cross section taken along line A--A of Fig. 1".

15. In re claim 4, Sabini discloses the fluid conveying machine as recited in claim 1, wherein said pump casing having a diffuser (see Fig 1, output section that arrow 34 points toward).

16. In re claim 5, Sabini/Vogel/Stepanoff as discussed above discloses the fluid conveying machine as recited in claim 1, wherein said pressure balance mechanism has a pair of variable clearances between each side of said impeller (see clearances in Fig 2 compared to Fig 1) and said pump casing to balance pressures on both sides of said impeller by sizes of said pair of variable clearances (see interpretation for balancing pressure in rejection for claim 1).

17. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sabini/Vogel/Stepanoff as applied to claim 1 above, in further view of Applicant Admitted Prior Art (AAPA).

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18. In re claim 6, Sabini/Vogel/Stepanoff as discussed above for claim 1 discloses the fluid conveying machine as recited in claim 1, wherein each said magnetic levitation motor includes a stator (1 of Vogel) and a rotor (4a of Vogel).

19. However, they fail to disclose wherein a stator forms two rotating magnetic fields, numbers of poles of which are different from each other by two, and a rotor (4a) rotated and magnetically supported by said two rotating magnetic fields.

20. Nevertheless, AAPA on page 1, line 14 states that "Specifically, there has been known a magnetic levitation motor which forms two rotating magnetic fields, the numbers of poles of which are different from each other by two, in the stator so as to provide a static magnetic force to the rotor in the radial direction and provide a rotational driving force to the rotor by superposition of the two rotating magnetic fields having different poles." This allows the rotor to rotate efficiently.

21. Therefore, it would have been obvious to one of ordinary skill in the art to modify Sabini/Vogel/Stepanoff as discussed above in view of AAPA by using magnetic levitation motors that form two rotating magnetic fields, the numbers of poles of which are different from each other by two, in the stator in order to provide a static magnetic force to the rotor in the radial direction and provide a rotational driving force to the rotor by superposition of the two rotating magnetic fields having different poles so that the rotor rotates most efficiently.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TODD D. JACOBS whose telephone number is 571-270-5708. The examiner can normally be reached on Monday - Friday, 7:30-5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on 571-272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit
3746

/TODD D. JACOBS/
Examiner, Art Unit 3746